SOUTHERN DESERTS 6

Conference Programme & Abstracts

23'S

Walvis Bay 25–30 August 2024

23° S Southern Deserts 6

Conference Programme & Abstracts



Walvis Bay, Namibia, 26 – 30 August 2024

www.southerndeserts.net

Only Namibian

I come from a country where the ocean and desert kiss Beautiful piece of savannah and sky...

- Zemha Gawachas

Extract from 'Only Namibian', published in My Heart in your Hands - Poems from Namibia (2020) Compiled by Naitsikile lizyenda and Jill Kinahan

Hosted by the Namib Desert Archaeological Survey, Namibia Archaeological Trust, Walvis Bay, Namibia, 26-30 August 2024

Contents

Dedication 5
Map of Walvis Bay showing conference venue 6
<i>Hurib de kares</i>
Introduction
Sponsors, partners & organizers10
Conference programme11
Abstracts
Session 1 Tides of the desert
Session 2 Marking the desert
Session 3 Tending the desert
Session 4 Mining the desert
Session 5 Living in the desert
Mid-conference day excursion information75

Everything that ever happened to me that was important happened in the desert. - Michael Ondaatje.

Dedication



Mike Smith (1955 - 2022) Photograph courtesy of Alan Williams

Southern Deserts 6 acknowledges the great contribution of Mike Smith, Australian archaeologist, scholar, historian, researcher and author. He was instrumental in the development of Central Australian archaeological research, establishing the antiquity of Aboriginal presence in the inland desert 35,000 years ago. He was the convenor of the first Southern Deserts Conference held in Canberra, Australia, in 2003. Mike may not have intended it so, but the Southern Deserts line of camels has been circling the globe ever since, with meetings in Arica (Chile), Molopo (South Africa), Mendoza (Argentina) and Karratha (Australia).



Location of conference venue, Pelican Bay Protea Hotel, The Esplanade, Walvis Bay

!Gomen-||gams (Walvis Bay) is situated on the traditional lands of the ‡Aonîn (Topnaar), alongside other Indigenous Namibian peoples.

Hurib di Kares Fredrika Kasper (Kuno Budack)

Huritse, huritse, kai ∥gamtse!	Sea, oh sea, great water
Sida ‡Aonîda ∥gamtse!	Water of us ‡Aonî
Kare re huriba, ‡Aonî gôado!	Praise the sea, you ‡Aonî
	children
Sada ge ∥îba xu kai hâ.	We have become great through it
!Naerudi tsî ∥hanidi,	Sting-rays and steenbras
‡Nū∥aun tsîna	and also galjoen
da ge ∥îba xu ge ‡û.	we have eaten through it
Kai huritse, kai ∥gamtse	Great sea, great water
‡Aonî gôada ∥gamtse!	Water of us ‡Aonî children
Dâu re, ‡nū domtse!	Flow, you black stream
Gôan da kaisetse!	Feeder of our children (?)
!Naerusa mā te re!	Please give me a sting-ray
Ēdeba mā te re!	Please give me a catfish
Hoeba mā te re!	Please give me a whale
Orobeba mā te re!	Please give me a sand shark
Hanisa mā te re!	Please give me a steenbras
‡Nū−am!nāba mā te re!	Please give me a stockfish
Dâu re, ∥nuitse!	Do flow, (oh) fat
Dâu re, ganxa!nâ gamtse!	Do flow, you water full of flesh

From Budack, K.F.R. (1977) The ‡Aonî or Topnaar of the lower !Khuiseb valley and the sea. *Khoisan Linguistic Studies 3*; orthography corrected by W. Haacke.

I think the desert dunes, especially the Barchans, must be accounted definite organisms, existing by themselves and owing nothing to the surrounding land for their shape...

For as long as they are fed with a supply of grains, and as long as a motive power is available from the wind – just as the true life requires food and motive power from the sun's rays to keep it alive – the dunes can move from place to place, can grow in size, can maintain their own particular shape and repair any damage done to them; and lastly, in the case of the Barchan dunes, there is some evidence that they are capable of a sort of reproduction, whereby baby dunes are formed in the open a hundred yards or so downwind of the horn of a fully grown parent.

R.A. Bagnold (1935) Libyan Sands - Travel in a dead world, page 199

Introduction

Welcome to Southern Deserts 6 and Walvis Bay, six years since the last meeting in Karratha, Western Australia, in 2018. Each Southern Deserts meeting since the first, held in Canberra, Australia, in 2003 has had its own character, reflecting the location of the meeting and its catchment of participants, and the shifting focus of desert studies. Southern Deserts 6 aims to re-invigorate comparative discussion across the three great southern hemisphere desert regions.

The conference programme includes 43 papers, comprising nine from South America, seven from Australia and 22 with an African or southern African focus. There are in addition, five papers with a more general focus, addressing global concerns from the perspective of the southern deserts. The papers are divided into thematic sessions including, for the first time, one devoted to mining and extractive industries and their impact on the deserts of the southern hemisphere.

One reason for delaying the conference until the COVID pandemic had passed is that virtual meetings do not suit the need of desert scholars to visit and experience their colleague's areas of research. This time we have a preconference excursion and a post-conference excursion, and for those unable to participate in those, a one-day excursion to the remarkable landscapes and archaeological sites in the central Namib Desert that are accessible from Walvis Bay.

As convenor I am grateful for the financial support of the Namibia Chamber of Environment and for the partnership of the Namibian institutions listed. We thank all our sponsors and partners for their generosity and goodwill, noting especially the support of the Wenner-Gren Foundation which made it possible to provide assistance to colleagues who might otherwise have not been able to attend the conference.

John Kinahan Namib Desert Archaeological Survey Conference convenor

Acknowledgement of sponsorship

Namibia Chamber of Environment: Conference venue Wenner-Gren Foundation: Conference grant to support selected delegates (Lead applicant Sian Sullivan, Bath Spa University; Co-applicants John Kinahan, Namibia Archaeological Trust, and Peter Veth, University of Western Australia) Namibia Archaeological Trust: Administrative organization Bannerman Resources (Pty) Ltd: Conference programme and abstracts Etosha-Kunene Histories (www.etosha-kunene-histories.net): Southern Deserts 6 website (www.southerndeserts.net) and additional Wenner-Gren costs



Namibian partners

National Museum of Namibia National Heritage Council of Namibia Geological Survey of Namibia Swakopmund Museum and Library Desert Hills (Pty) Ltd Swakopmunder Buchhandlung and Die Muschel Book & Art Shop



Organizers

John and Jill Kinahan, Namib Desert Archaeological Survey Sian Sullivan, Bath Spa University Peter Veth, University of Western Australia David Thomas, Oxford University

Conference Programme



Middle Stone Age artefact made on yellow cryptocrystalline chert.

Sunday 25 August 2024

17:00-19:00	Registration Pelican Bay Hotel Conference wing
19:00-20:30	Welcome Drinks at The Raft

Monday 26 August 2024

08:00-09:00	Registration Pelican Bay Hotel Conference wing
09:00-13:30	Art & book sales, Pelican Bay Hotel Conference venue
	(also Tue depending on interest)

Session 1 TIDES OF THE DESERT Chair Paul Hesse

09:00–09:20 Keynote paper John Kinahan
Seen from a dune: Archaeological perspectives from the Namib Desert
09:20–09:40 David Thomas
The Empty Desert? Challenging conventional wisdom about early human survival in the southern African desert interior
09:40–10:00 Kane Ditchfield et al.
Pleistocene deserts and the sea: Recent excavations from the arid coast, Cape Range, in northwestern Australia
10:00–10:20 Claudio Latorre et al.
Holocene upwelling intensity linked to hunter-gatherer expansion and collapse along the Eastern Boundary System of coastal northern Chile

10:20–10:40 TEA

10:40–11:00 Roger Swart et al.

Dunes: A key to understanding age of river capture11:00–11:20Marion MeyerEuphorbia damarana: The giver and taker of life in the Namib Desert11:20–12:00Video introduced by Agnes ShiningayamweThe Namib Sand Sea World Heritage Site12:00–12:20Discussion

12:20–13:20 LUNCH

Session 2 MARKING THE DESERT Chair Agnes Shiningayamwe

13:20–13:40 Keynote paper Jill Kinahan et al.
Contact and trade: Namib Desert, Namaqualand and Fuego-Patagonia
13:40–14:00 Angela Kabiru
Beads and authenticity: The changing faces of 'Mporo' necklace
14:00–14:20 Jacqueline del Carmen Correa Lau
Textile Heritage that conserves and safeguards life histories of the Atacama
Desert
14:20–14:40 Mónica Berón
Travelling across the desert beyond death: Funeral bundles from the cemetery
Chenque 1 site, La Pampa, Argentina

14:40-15:00 TEA

15:00–15:20 Jayson Orton

Does material culture relate to economy and/or ethnicity? Observations from western South Africa

15:20–15:40 Natalie Franklin & Phillip Habgood

Gilparrka Almira, a rock art site in Mithaka Country, southwest Queensland, Australia

15:40–16:00 Anahí Re et al.

Animal predators and humans in southern Patagonia's Late Holocene rock art 16:00–16:20 Guadalupe Villanueva

Building resilience at persistent places through social memory: Assessing the role of rock art in the making and endurance of cultural keystone places in Patagonia (South America)

16:20–16:40 Discussion

Tuesday 27 August 2024

08:00-09:00 Art & book sales Pelican Bay Hotel lobby

Session 3 TENDING THE DESERT Chair Genevieve Dewar

09:00–09:20 Keynote paper Sian Sullivan & Welhemina Suro Ganuses Cultural heritage and histories of the Northern Namib/Skeleton Coast National Park

09:20–09:40 Robert Hitchcock & Melinda Kelly

Dryland hunter-gatherer resilience: The G|ui and G||ana San of the Central Kalahari Region, Botswana

09:40-10:00 Phillip Habgood

Channel country, wooden swords and new links in the Chain of Connection in Mithaka Country, southwest Queensland, Australia

10:00–10:20 Wendy Reynen et al.

Water sources in the desert: Preliminary results from an important arid-zone water source, Goodingu, on Thalanyji Country, northwestern Australia

10:20-10:40 TEA

10:40–11:00 Kiah Johnson

Drylands: Studying the transhumant, ephemeral past in the Northern Cape, South Africa and Namibia combining remote sensing and oral histories

11:00–11:20 Marlize Lombard

A case for springbok funnel-hunting with the Keimoes desert-kite structures, South Africa

11:20–11:40 Matt Lotter et al.

Looking for stonewalled desert kites in the Nama Karoo Biome of South Africa: Aerial desktop survey and exploration of landscape movements through predictive modelling and GIS

11:40–12:00 Jeremy Hollmann

Imagining a 'pleasant place': A rock engraving site in the Trans-Gariep Nama Karoo, South Africa

12:00–12:20 Discussion

12:20–13:20 LUNCH

Session 4 MINING THE DESERT Chair Roger Swart

13:20–13:40 Keynote paper Karin Olson Hoal
Mineral resource sector sustainable development in the energy transition
13:40–14:00 Vanessa Elliott
Share Benefits, Inclusion Capital: Are we there yet? The resources sector journey to First Nations in Australia
14:00–14:20 Elsemi Olwage
Working with the ‡Aonîn: Land, conservation, mining and extraction
14:20–14:40 Juris Burlakovs et al.
Geotechnical challenges for landfill planning in arid semi-desert and desert regions

14:40–15:00 TEA

15:00–15:20 Chris Hill

Redeeming Nature: Desert extraction and the Protestant ethic in Namibia15:20–15:40Mike HannisEthical mining: A conceptual overview15:40–16:00Agnes Shiningayamwe & Lenishwa EngelbrechtPreserving Namibia's heritage: Challenges and opportunities for theNational Heritage Council

16:00–16:20 John Kinahan

A suggested protocol for mining and heritage protection in the Namib Desert16:20–16:40Discussion

19:30–21:30 Video introduced by Sian Sullivan and Welhemina Suro Ganuses

Lands that History Forgot – Three Journeys with Nami-Daman Elders in north-west Namibia (https://vimeo.com/906331479)

Wednesday 28 August 2024ExcursionSEEING THE DESERTGuide John Kinahan

09:00	Depart Walvis Bay. Visit Moon Landscape and 1915 desert
	battlefield site
13:00	Goanikontes Oasis. Lunch stop; after lunch visit mid-Holocene
	desert encampment
18:00-19:30	Swakopmund. Evening lecture at Swakopmund Museum by
	David Thomas - "The Sheltering Desert"
21:30	Return Walvis Bay. Late return to allow people to eat and
	explore Swakopmund

See page 76 for map and information

"the eye rests, over a distance of many miles, on nothing other than signs of barrenness, no stream is there to quench the thirst, no root to still the gnawing hunger" - James Archbell.

Vigne, R. (1991) citing Archbell (1823) unpublished.

Thursday 29 August 2024 Session 5 LIVING IN THE DESERT Chair Erik Marsh

09:00-09:20 Keynote paper Peter Veth et al. 50 000 years of resilience in the Australian deserts: The Desert People Project 09:20-09:40 Fiona Hook 50,000 years of semi-arid zone maritimity, Boodie Cave, Barrow Island, NW Australia 09:40-10:00 Daniela de Matos et al. The PaleoLeba Project: Investigating Stone Age culture and landscape change in the Angolan Namib Desert Patrick De Deckker et al. 10:00-10:20 The timing of megafaunal extinction in Australia and human interactions

10:20–10:40 TEA

10:40–11:00 Paul Hesse et al.

Dramatic environmental change in Andean/pre-Andean drylands in the Holocene

11:00–11:20 Nora Franco et al.

Evaluating possible reasons for chronological hiatuses and technological changes in Central-South Patagonia: The case of the Pleistocene-Holocene transition and the early Holocene

11:20–11:40 Erik Marsh

It's a long shot: The 'impact' of arid climates on the use and transmission of the sling and the bow in South America

11:40–12:00 Discussion

12:20–13:20 LUNCH

Session 5 (cont.) Chair Marlize Lombard

13:20–13:40 Matthias Blessing & Aurore Val

Arid environments and modern humans' adaptation strategies - introducing the ARIMAS project

13:40–14:00 Genevieve Dewar et al.

A Late Pleistocene palaeoenvironmental record for northern Namaqualand, South Africa: Geoarchaeology, geochronology, and stable isotopes from Spitzkloof A Rockshelter

14:00–14:20 Courtneay Hopper et al.

Trade, diversification, and thriving in a desert: The view from Spitzkloof D Rockshelter in northern Namaqualand, South Africa

14:20–14:40 Daniela Valenzuela et al.

Human/camelid encounters: The changing role played by camelids in the economy of the fisher-hunter-gatherers on the coast of the Atacama Desert (ca. 4000–500 BP)

14:40–15:00 TEA

15:00–15:20 Carla Lancellotti

Unlocking archaeology's potential: Building bridges across disciplines for sustainable development 1/2

15:20–15:40 Stefano Biagetti

Unlocking archaeology's potential: Building bridges across disciplines for sustainable development 2/2

15:40-16:00 Discussion

16:00–16:50 Video introduced by David Thomas

1930 Sahara Desert Exploration Egypt and Libya with Ralph A. Bagnold, pioneer of desert travel and research on aeolian science https://youtu.be/K1HHMrp07tE

18:30 Conference Dinner at Raft Restaurant

Friday 30 August 2024 Session 6 SD6 CLOSING SESSION Chair David Thomas

09:00-10:00PlenaryPeter VethSouthern Deserts6: Overview and the way forward10:00-11:00Closing discussion

If we need a model for caring for the Australian environment, then it is not a time for outsourcing to Europe or America. We have a homegrown job applicant with 50,000 years of experience.

- David Horton

Abstracts



Rock engraving of oryx leaving human and antelope spoor, |Ui-||aes (Twyfelfontein) World Heritage site.

I hate archaeology. ...with Gertrude [Caton Thompson] our whole conversation is either ancient flints or tinned food: there seems no halfway house.

Freya Stark (1893–1982). Correspondence cited by Caroline Moorehead (1985) *Freya Stark*, page 61.

Session 1 TIDES OF THE DESERT



Fixed and mobile dunes, near Ukama wells, Tsau-||Khaeb National Park

Seen from a dune: Archaeological perspectives from the Namib desert

John Kinahan

Namib Desert Archaeological Survey, Windhoek, Namibia; jkinahan@iafrica.com.na

The one-million-year Namib Desert archaeological sequence is characterized by long periods of silence punctuated by episodes of intensive human occupation. In the earlier Pleistocene period, evidence is in the form of dispersed stone artefact scatters on deflation surfaces. Stratigraphically sealed deposits have been investigated at several late Pleistocene sites, but well-preserved lithic, faunal and other evidence is confined to Holocene sites.

Correlation of Holocene occupation history with regional and global climatic data provide a record of human adaptation to unpredictable conditions in a hyper-arid environment. Early Holocene evidence of climatic stability is linked to widespread human occupation on the edges of the Namib Desert. Moist pulses in the mid-Holocene led to penetration of the desert itself. The late Holocene arid cycle prompted retreat and a movement towards mountain refugia. Human responses to hyper-aridity in the late Holocene Namib Desert include intensification of social and ritual life evidenced by an efflorescence of rock art and the appearance of specialized subsistence practices.

The acquisition of ceramic technology from food producing communities about 2,000 years ago formed the basis of a unique local exploitation of desert grass seed and endemic *!nara* melons. Pottery was adapted to an entirely new process, the preparation and storage of wild plant foods. These adaptive responses ensured a new measure of food security in an economy largely based on livestock production. This and other innovations effectively "domesticated" the desert itself. Processed wild plant foods not only provided a hedge against famine; they were also associated with a significant increase in site density, suggestive of higher and more stable populations. Archaeological evidence of these practices provides uniquely detailed insights into land and resource use, and especially the work of women in desert communities.

The empty desert? Challenging conventional wisdom about early human survival in the southern African desert interior

David S. G. Thomas

University of Oxford; david.thomas@ouce.ox.ac.uk

Anthropological and archaeological encounters with recent human history in southern hemisphere deserts provide a plethora of evidence of nuanced human engagement in even the driest regions. Yet for deeper human history in southern Africa, conventional wisdom is dominated by narratives of exodus during drying phases, of empty wilderness, with key human innovations and cognitive developments during the Middle Stone Age (MSA) seen as occurring in wetter regions, particularly in resource-rich coastal domains.

Several strands of evidence gained over two decades of research challenge the concept of the southern African interior as an empty wilderness during key MSA phases of the Late Quaternary. First, tempro-spatial palaeoenvironmental data show both great hydrological dynamism through the last 200 kyr and the presence of riparian corridors of opportunity. Second, detailed field survey has catalogued hundreds of open air MSA sites through the region that testify to an extensive MSA human presence, including beyond riparian zones. Third is that excavation, coupled with robust environmental assay and chronometric data, reveals widespread usage of one of the harshest environmental contexts in the interior: the saline floor of palaeolake Makgadikgadi. This usage was not 'by chance', but was planned and purposeful, as evidenced by the resource context of the excavated sites, which reveal considered movement of lithicsource materials over great distances for the manufacture of specific tools.

These data point towards the southern African desert interior being a key landscape for early human innovations during the Middle Stone Age. The mantra for research in the subcontinent could almost be 'seek and you shall find' since taphonomy appears to have played a significant part in the development of the widespread acceptance of a 'coast is key' perspective.

Pleistocene Deserts and the sea: Recent excavations from the arid coast, Cape Range, in northwestern Australia

Kane Ditchfield¹, Wendy Reynen¹, Chae Byrne¹, Peter Veth^{1,2}

¹Department of Archaeology, Forensics, Geography and Anthropology, UWA; <u>kane.ditchfield@uwa.edu.au</u>

²ARC Centre of Excellence for Indigenous and Environmental Histories and Futures

Outside of Africa, relatively little is known about Pleistocene coastal occupation, and this is particularly the case for the occupation of arid, desert coastlines. In Australia, recent research has suggested that, despite an almost continental-wide lack of evidence, Pleistocene coasts were likely widely occupied and productive. Cape Range and Barrow Island, located in the arid northwest of Australia, represent the only locations with multiple Pre-LGM, Glacial and Post-LGM records of Pleistocene occupation. The environment is semi-arid - arid with most rainfall occurring as the result of episodic cyclonic activity. Yet, these environments remain productive and have been exploited by Aboriginal people for 50,000 years. This paper reports on recent excavations from the western coast and central Cape Range. The sites profiled include Mandu Mandu Creek South Rockshelter 8, Winderabarndi Rockshelter and Goolyoo Cave which were excavated in collaboration with the Nyinggulu Joint Management Board and Ranger team. The importance of these sites to both regional chronologies and the national record on desert Pleistocene coastal occupation is discussed.

Holocene upwelling intensity linked to hunter-gatherer expansion and collapse along the Eastern Boundary System of coastal northern Chile

<u>Claudio Latorre</u>^{1,2}, Gonzalo Macaya¹, Chris Harrod³, Susana Monsalve⁴, Tania V. Villalón¹, Calogero M. Santoro⁴

¹Centro UC Desierto de Atacama & Facultad de Ciencias Biológicas, Pontificia Universidad Católica de Chile, Santiago, Chile; <u>clatorreh@uc.cl</u> ²Instituto de Ecología y Biodiversidad (IEB), Santiago, Chile ³Instituto de Ciencias Naturales Alexander von Humboldt, Universidad de Antofagasta, Antofagasta, Chile

⁴Instituto de Altas Investigaciones (IAI), Universidad de Tarapacá, Arica, Chile

Eastern boundary systems share several unique features. They are driven by large-scale atmospheric subsidence, bounded by parallel offshore winds and are highly productive marine ecosystems owing to the abundant nutrients brought to the surface via Ekman transport. Recent palaeorecords have shown significant variations in upwelling systems over centennial to millennial timescales. We present almost a decade of research using shell middens from northern Chile to record past changes in coastal upwelling and its impacts on human ecology. Found throughout coastal northernmost Chile, these deposits span more than 9000 years and are extraordinarily well-preserved. We developed three different biogeochemical and ecological approaches to extract past environmental records of upwelling. First, radiocarbon dating from multiple shell middens yielded estimates of marine reservoir departures from the global marine 14C calibration curve (ΔR). Departures in ΔR are due to shifts in water masses with different apparent 14C ages linked to ocean circulation. Second, we measured δ 15N from sessile bivalves (mytilids) to track upwelling intensity. Third, we identified shellfish consumed by hunter gatherers to identify major dietary shifts. Our record implies that stable upwelling during the Early and Late Holocene was interrupted by strong millennial-scale environmental fluctuations during the Middle to Late Holocene. Such variability is linked to changes in the long-term behaviour of El Niño-Southern Oscillation (ENSO) and the strength of the South Pacific High (SPH), and had profound consequences for past coastal populations. Acknowledgments: FONDECYT 1231820, FONDECYT 1191568. FB210006, NCN_153 UPWELL

Dunes: A key to estimating age of river capture

<u>Roger Swart</u>¹, Tolene Kruger², Abner Nghoongoloka³, Anna Nguno³, Leo Cury³

¹BlackGold Geoscience, Windhoek, Namibia; rogerswart@afol.com.na

²Antler Gold, Windhoek, Namibia

³Geological Survey of Namibia, Windhoek, Namibia

⁴Universidade Federal do Paraná, Curitiba, Brazil

A small, relatively unknown palaeo-dune field lies west of an unnamed palaeo-drainage course which appears to have flowed southwards from the Kunene River and is probably the palaeo-course of the Kunene. Occasional pans are all that remain of this old drainage. A slightly larger dune field is found in Angola north and west of the modern Kunene River. This study aims to understand firstly the ultimate source of the sand in the dune field and, secondly, to determine the age of the dunes. This information may be key in defining the age of the capture of the Kunene.

A 20 m high foredune is present along the eastern edge of the dune field, separating the linear dunes from the palaeo-drainage. Dunes trend roughly 290° and are now degraded and vegetated. This trend is roughly parallel to dunes some 275 km to the south-south-east which were deposited by easterly winds. The dune fields are now vegetated and form part of the Uukolonkadhi Community Forest. These dunes have therefore been called the Uukolonkadhi Dunes.

The sandy dune areas are characterised by mopani woodland whereas the interdunes are dominated by heavy, black clay soils where pans form during the rainy season. There are positive thorium anomalies in the interdune and palaeodrainage areas.

Dune and interdune areas were sampled for zircon analysis to determine the ultimate source of the river sands from which the dunes are derived. Zircons are abundant probably because of proximity to the fluvial source area. The bulk of the zircons cluster around 2.0Ga. The minor 1.3-1.5Ga population may be significant as that suggests that some of the sand is derived from the Kunene Igneous Complex. Future work will concentrate on OSL age dating of the dunes.

Euphorbia damarana: The giver and taker of life in the Namib Desert

Marion Meyer, Mmankeko Degashu, Nicole Meyer and Marie Potgieter Department of Plant and Soil Sciences, University of Pretoria, South Africa; <u>marion</u>. <u>meyer@up.ac.za</u>

Euphorbia damarana, also known as Damara milk bush, grows only in the north-western desert areas of Namibia and southern Angola. The local inhabitants used its latex previously in arrowheads and even today know that it is extremely poisonous to humans and animals. It is often the only large plant in these desert regions and during the 1960s twenty-seven migrating mineworkers used its dead branches as firewood for their barbecue with deadly consequences. They all passed away after consuming meat that was infused with toxic volatiles in the smoke. This presentation reports on the identification of the toxic compound, euphol, present in high concentrations in the stems and smoke of *E. damarana*.

Although the Damara milk bush is toxic to humans and livestock, various indigenous animals have adapted to consume the plant's succulent branches and fruit. Springbok, oryx, kudu, and black rhino feed on these plants, while unconfirmed reports from locals also suggest that klipspringer, baboons, and porcupines consume their stems and/or fruit. During droughts, these succulents become a crucial source of food and moisture for herbivores. The Namibian oryx, for example, is thought to derive more than 25 percent of its diet from the Damara milk bush and even much more during droughts.

Few plant species can survive on the sandy desert soils and the increase in temperatures caused by climate change. Comparison of aerial photographs of the 1960s and recent high-resolution satellite images showed that very high percentages of *E. damarana* have died during the last 50 years in the Namib Desert. This decline is more pronounced in the sandy parts of the desert than on less sandy hills and mountains. Areas like Brandberg with a high sand content, have seen the loss of around 90 percent of Damara milk bushes in this period. This is alarming because during droughts it could affect the survival of several animal species which have adapted to feed on them.

Sharp changes took place twice a day – in the morning when the sun had risen to an altitude of 35 degrees and in the afternoon when it was again within 35 degrees of the horizon. For between 30 and 35 degrees lies the critical angle at which loose grains begin to flow, so that no sand slopes can be steeper than this. While in the early morning and late afternoon, therefore, the big dunes stand out as high cliffs casting grey and purple shadows, during the midday hours nothing can cast any shade at all in the whole vast area of the Sand Sea. At the right time in the morning one can see dark mountains collapsing, as one watches, into curving mounds of glowing gold.

R.A. Bagnold (1935) Libyan Sands - Travel in a dead world, page 106

Session 2 MARKING THE DESERT



Engraving of two sitting ostriches at |Ui-||aes (Twyfelfontein) World Heritage site

Contact and trade: Namib Desert, Namaqualand and Fuego-Patagonia

Jill Kinahan¹, Jayson Orton² and Amalia Nuervo Delauney³

¹Namib Desert Archaeological Survey, Windhoek, Namibia; <u>jillkinahan@iway.na</u> ²ASHA Consulting (Pty) Ltd, Cape Town, South Africa ³Centro de Investigación en Ecosistemas de la Patagonia, Coyhaique, Chile

The process whereby Indigenous people and Western seafarers were drawn into relations of exchange is archaeologically visible through the number and context of Western trade goods found on Indigenous sites. Artefacts made from glass illustrate a sequence of domination and replacement of local materials as control of trade and land slipped from Indigene to settler over the colonial period. Sites in three different regions, Namibia, South Africa and Chile/Argentina illustrate the process: a mid-18th century site near Walvis Bay shows a predominance of Indigenous material during initial contact. This is corroborated by a similar assemblage on a coastal site in Namaqualand, South Africa. Scrapers from hunter-gatherer sites in Fuego-Patagonia evidence a contrasting pattern where reliance on stone changed with the use of glass during the 20th century to enable a booming trade in processed guanaco hides. The Indigenes of Walvis Bay and Namagualand inhabited pockets of uncontested space in the early colonial period, becoming marginalized and impoverished under colonial rule. Fuego-Patagonians, in contrast, initially had no toehold in trade but when confined to large reservations in the 20th century, their cultural traditions flourished and opportunities for trade arose.

Beads and authenticity: The changing faces of the 'mporo' necklace

Angela Kabiru

Post Graduate Research Fellow, Mapping Africa's Endangered Archaeological Sites and Monuments, National Museums of Kenya/British Institute in Eastern Africa, Nairobi; <u>akabiru07@gmail.com</u>

Beads have for several centuries been central to dress and ornamentation among indigenous peoples of Africa. The coming of glass beads revolutionized cultures around the world in terms of fashion, and trade. According to archaeological research, ornamentation is one of the defining characteristics of modern human behaviour. Ornamentation, while mainly of aesthetic value, is also an important part of ceremonial and ritual uses. The late 19th century saw a drastic increase in the supply of glass beads, with East Africa ranking third in their importation, thanks to explorers, missionaries and long-distance traders. But while glass bead production is not African, beaded items are recognized as part of African and indigenous people's dress. The *mporo* necklace made by the pastoral Samburu and Rendille of Northern Kenya, is an item that has undergone several changes in the last 100 years and continues to evolve due to its cultural significance. In this paper I present a summary of the importance of *mporo* from secondary literature and add my own thoughts on the changing 'authenticities' around this item.

Textile heritage that conserves and safeguards life histories of the Atacama Desert

<u>J. Correa Lau¹</u>, C. M. Santoro¹, Ester Echenique¹, C. Latorre², J. Capriles³, A. Domic³, L. Hernández⁴

¹ Universidad de Tarapacá, Arica, Chile; jcorreal@academicos.uta.cl

² Pontificia Universidad Católica de Chile, Santiago, Chile.

³ The Pennsylvania State University, State College, PA, USA.

⁴Universidad Arturo Prat, Iquique, Chile.

The hyper-arid Atacama Desert is extraordinary in terms of preservation of organic materials, including textiles. The regions of Arica and Parinacota have been home to human societies between the coast and the valleys of northern Chile for more than 11,000 years. Among hundreds of textiles found, three Inka unku have been conserved. Unku were masculine tunics which safeguarded in their fibre life stories crossing different cultures and periods. These textiles, entrusted to dignitaries inside and outside central society, represented power, prestige, and status. They acted as territorial insignia of the empire generating a close and dynamic relationship between the State and provincial communities, strengthening political, economic, and military relations. Imperial unku production was highly regulated under morphological, technical, and stylistic standards which could explain the agency that concatenated state structures and the identities of provincial communities. Of the three cases presented here, two are associated with Arica (possibly valleys) and the third with Caleta Vitor (coast), the latter being the only known case of an *unku* archaeologically excavated in stratigraphic context. Technical-visual analysis shows that these three unku each have morphological, technical, and stylistic parameters denoting their provincial origin, which makes them representative of localities annexed by the Inka Empire. Archaeometric studies such as radiocarbon dating will determine the period when they were created, and its possible coincidence with Inka territorial expansion. Stable isotope analysis will indicate the possible area of production, origin of the fibres and state control over raw materials. FTIR will verify the origin of the colour (natural or dyed). This theoretical-empirical narrative strengthens the discussion on the relationship between the State and local communities.

Travelling across the desert beyond death. Funeral bundles from the cemetery Chenque I site, La Pampa (Argentina)

Mónica Berón

IDECU, CONICET, Argentina; monberon@retina.ar

The use of funeral bundles as a mortuary practice is wide-spread both in America and other parts of the world, although with great variations in terms of their manufacture, materiality, meaning and social function.

In the Chenque I cemetery, located in the centre of the semi-desert region of La Pampa (Argentina), various cases of bundle burials have been recorded. Some are adults related to events of inter- or intragroup violence, corresponding to an earlier stage of the cemetery (ca. 1000 to 700 years BP). In the recorded cases, the bundles would have been transferred after initial burial in their residential area. Others are made up of several subadults, always in primary mode (6 to 10) with one or two adults. The inclusion in bundles was carried out immediately after death. The mass death represented in this case might have occurred due to some epidemic or famine and corresponds to the last use of the cemetery (ca. 435 to 290 years BP). The purpose of wrapping was to transport the dead from immense distances for final burial in this cemetery of great regional symbolic value.

Containers were made of hides, possibly ñandu or mammal skins, probably guanacos, gauging from fragments of painted skins recovered, as well as documentary information.
Does material culture relate to economy and/or ethnicity? Observations from western South Africa

Jayson Orton

ASHA Consulting (Pty) Ltd, Cape Town, South Africa; jayson.orton@gmail.com

In 1991 Smith and colleagues published a seminal paper that must be one of the most often cited papers in discussions about precolonial material culture among southern African hunter-gatherers and herders. Hunter-gatherer sites were said to contain many retouched stone tools and small ostrich eggshell beads, with pottery forming only a very small component of those assemblages dating after 2000 BP. Herder occupations revealed informal stone tools and large beads in the presence of abundant pottery.

Work in northern and central Namaqualand revealed three lithic artefact-making traditions. While typical hunter-gatherer and herder lithic assemblages were clear, ostrich eggshell beads were found to increase in size with time regardless of lithic affinity. However, a third group with a very specific lithic assemblage, and the presence of 'combination assemblages' confused matters.

New work in southern Namaqualand has revealed occupation sites that variably combine large numbers of retouched tools, a mix of ostrich eggshell bead sizes, decent pottery assemblages and historical trade goods. The trade goods suggest that these sites were occupied by the Khoekhoen (presumed to be herders). Could this be ascribed to regional variation or were Smith et al. wrong?

Gilparrka Almira, a rock art site in Mithaka Country, southwest Queensland, Australia: Cultural connections, archaeology, dreaming tracks and trade routes

Natalie R. Franklin and Phillip J. Habgood

School of Social Science, The University of Queensland, St Lucia, Brisbane, Australia; <u>drphilanddrnat@outlook.com</u>

Gilparrka Almira is a rock engraving site located in Mithaka Country, southwest Queensland.

Mithaka Country is situated roughly in the centre of the Channel Country, an extensive endorheic river system which supplies most of the water to the vast inland Lake Eyre-Kati Thanda. This environment is a "boom and bust" ecological system, where the desert experiences massive semi-annual floods deriving from monsoonal rainfall in the north, which fills thousands of braided channels for which the region is named.

Extensive exchange/trade routes criss-crossed Australia, incorporating large-scale expeditions where goods/items moved across the country through reciprocal exchange, short-distance down-the-line barter and long-distance transfer of materials. Mithaka Country lies near the centre of one of these exchange systems, the extensive Kati Thanda-Lake Eyre Basin trade network.

Regional comparisons found that Gilparrka Almira has the highest percentage of crescent motifs and designs compared to other recorded rock art sites. Ethnohistorical sources indicate that crescent motifs may bear a range of "discontinuous" meanings that can be used in different contexts. Crescent motifs may have moved/diffused across extensive distances, following the Lake Eyre Basin trade network and other trade routes, along the Dreaming tracks with which the trade routes are frequently associated. Motifs with "discontinuous" meaning ranges, like crescents, would have been particularly suitable for use in this scenario because of their ability to be readily incorporated into different social contexts.

The research on which this presentation is based was undertaken in collaboration with the Mithaka Aboriginal Corporation.

Animal predators and humans in southern Patagonia's Late Holocene rock art

Anahí Re¹, Juan Dellepiane² and Francisco Guichón³

¹ Instituto Nacional de Antropología y Pensamiento Latinoamericano (INAPL)-Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)-Universidad de Buenos Aires (UBA). Ciudad Autónoma de Buenos Aires, Argentina; <u>anahire1@</u> gmail.com

²Instituto Nacional de Antropología y Pensamiento Latinoamericano (INAPL)-Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)-Universidad de Buenos Aires (UBA). Ciudad Autónoma de Buenos Aires, Argentina.

³ Comisión Nacional de Actividades Espaciales (CONAE)-Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)- Ciudad Autónoma de Buenos Aires, Argentina.

During the Late Holocene the main animal predator in southern Patagonia has been the puma (*Puma concolor*). This feline is scarcely present in the archaeofaunal assemblages, with very little evidence of human consumption. On the contrary, it has been represented in many archaeological sites through engraving and, in lesser frequencies, through painting. Huntergatherer groups have selected to represent its footprints in a large variety of dispositions (isolated, in pairs and in tracks). Thus, these images are one of the most conspicuous rock art motifs during this period.

In previous works we have considered how these societies have chosen to include the figure of the guanaco (*Lama guanicoe*), the larger prey in Patagonia, in rock art images. In comparison to earlier times, this animal is present in fewer frequencies in the repertoire of the later periods.

In this presentation we characterize the rock art motifs that refer to the puma during the Late Holocene in southern Patagonia. We synthetize their spatial distribution, morphology, technique and associated images. We also compare the rock art trends we observe to other data available, including archaeofauna and ethology. Taking into account all the information, in this work we seek to discuss the role of this animal predator in the human populations that inhabited this southern desert's rock art. We propose that in an increasing arid environment where resources are heterogeneously distributed, information on tracking the larger ecological competitor would have been of high importance for hunter-gatherers.

Building resilience at persistent places through social memory: Assessing the role of rock art in the making and endurance of cultural keystone places in Patagonia, South America

<u>Guadalupe Romero Villanueva</u>¹, Marcela Sepúlveda² and Ramiro Barberena³

¹Consejo Nacional de Investigaciones Científicas y Técnicas, Instituto Nacional de Antropología y Pensamiento Latinoamericano, Ciudad Autónoma de Buenos Aires, Argentina; <u>guada.romero.arq@gmail.com</u>

²Departamento de Ciencias Sociales, Universidad de Tarapacá, Iquique, Chile. ³Instituto Interdisciplinario de Ciencias Básicas, Consejo Nacional de Investigaciones Científicas y Técnicas, Universidad Nacional de Cuyo, Mendoza, Argentina. Centro de Investigación, Innovación y Creación (CIIC-UCT), Facultad de Ciencias Sociales y Humanidades, Universidad Católica de Temuco, Temuco, Chile.

Data from the long albeit discontinuous human occupational sequence at Cueva Huenul 1 (CH1) site incorporates recent crucial information on the earliest directly dated rock art motifs in Argentina. These data enhance understanding of the emergence of rock art in Patagonia within the complex human-environment interactions deployed by hunter-gather groups dwelling at the southernmost tip of the South American Arid Diagonal during the mid-Holocene. Multiscalar archaeological and palaeoecological results showed that CH1 functioned as a 'cultural keystone place'. The site was used for over 12 ka through the Holocene as a visual communication and information exchange spot during a challenging period of climate change. The replication of a standardized rock art motif over 3,000 years revealed that desert dwellers returned to CH1 during the mid-Holocene, a period of enhanced aridity, to visually encode and decode traditional information inscribed on the cave's wall, retaining and reproducing a long-term memory of their ties to this place and place-based communication practices. The millenary survival of this traditional knowledge encoded in rock art suggests the importance of the socialization of the landscape through information exchange and the construction of lasting social networks to build human resilience in contexts of socio-ecological stress in desert environments.

Praise poem for the *!naras* Fredrika Kasper (Kuno Budack)

!Gubu ‡ûse	You round food
khūxa khāse	with many thorns
‡guisammese	you many-breasted
‡Aonî gôan di kaikai-aose	foster-mother of the ‡Aonî children
!nūse ta ga hā	even if I am far away
xawe ta nî ‡âi si	I will think of you
Ti ∥naon ‡ûse	you food of my ancestors
uru si ta tide	l will never forget you
Sas khemi ge daisikhoes a khai	There is no wet nurse like you

From Budack, K.F.R. (1977) The ‡Aonî or Topnaar of the lower !Khuiseb valley and the sea. Khoisan Linguistic Studies 3; orthography corrected by W. Haacke

Session 3 TENDING THE DESERT



‡Aonî (Topnaar) woman harvesting *!nara* melon in the !Khuiseb Delta area, Namib (*photograph courtesy of WHG Haacke*)

Cultural heritage and histories of the Northern Namib / Skeleton Coast National Park

Sian Sullivan¹ and Welhemina Suro Ganuses²

¹Professor of Environment and Culture, Bath Spa University; Research Associate, Gobabeb Namib Research Institute; <u>s.sullivan@bathspa.ac.uk</u>

²Councillor, Nami-Daman Traditional Authority; Administrator, Save the Rhino Trust Namibia

We outline Indigenous cultural heritage and histories associated with the Northern Namib desert, designated since 1971 as the Skeleton Coast National Park (SCNP). We draw on two principal sources of information: 1) historical documents stretching back to the late 1800s; and 2) oral history research with now elderly people who have direct and familial memories of using and living in areas now within the Park boundary. We affirm that localities and resources now part of the Park were used by local people in historical times, their access linked with the availability of valued foods, especially Inara melons (Acanthosicyos horridus) and marine foods such as mussels. Memories about these localities, resources and cultural heritage dimensions, including graves of family members, remain lively for some individuals and their families today. These concerns retain cultural resonance in the contemporary moment, despite significant access constraints over the last several decades. Suggestions are made for foregrounding an understanding of the Northern Namib as a remembered cultural landscape, as well as an area of high conservation value; and for protecting and perhaps restoring some access to sites that may be considered of significant cultural heritage value. Such sites include graves of known ancestors and named and remembered former dwelling places. The material shared in this paper may contribute to a diversified recognition of values for the SCNP with relevance for the new Management Plan that will shape ecological and heritage conservation practices, and visitor experiences, over the next 10 years.

This paper draws on material in research outputs from *Future Pasts* (www.futurepasts.net) and *Etosha-Kunene Histories* (www.etosha-kunene-histories.net)

Dryland Hunter-Gatherer Resilience: The G/ui and G//ana San of the Central Kalahari Region, Botswana

Robert K. Hitchcock and Melinda C. Kelly

rkhitchcock@gmail.com

At 52,730 km², the Central Kalahari Game Reserve (CKGR) is the largest protected area in Botswana, consisting of dryland tree-bush savanna and a wide diversity of plants, mammals, reptiles, and amphibians. Rainfall which varies spatially and temporally averages 350–400 mm per annum.

Resilience is the capacity to withstand or to recover quickly from environmental difficulties. The G|ui and G||ana are two of the San populations in the CKGR who in the past were primarily mobile hunters and gatherers.

The Botswana Government banned subsistence hunting in the Central Kalahari in 2004. The national hunting ban was applied in the central Kalahari and all protected areas, Wildlife management areas, and communal (tribal) land in 2014.

Residents of the Central Kalahari were resettled involuntarily by the Government of Botswana in 1997, 2002, and 2005. Those who wanted to remain took the government to court and won, returning to the Central Kalahari in 2007. Today in 2024, there are 350 people in five communities which survive through gathering, occasional commodity and water provision by the government and help by relatives and friends outside the reserve.

Some keep domestic animals but not cattle for milk and meat. Their animals are exposed to human-wildlife conflict, especially predation by lions, hyenas, and jackals. Some of the water they obtain is in the form of melons. They also dig sip wells into the sand near pans, sucking the water out of the ground using straws made of local plant materials.

The resilience of the people of the Central Kalahari is demonstrated not only by their innovative resource management strategies but also by their willingness to seek assistance from non-government organizations who have provided them with various kinds of support including legal advice.

Channel country, wooden swords and new links in the Chain of Connection in Mithaka Country, southwest Queensland, Australia.

Phillip J. Habgood

School of Social Science, The University of Queensland, St Lucia, Brisbane, Australia; drphilanddrnat@bigpond.com

During an ongoing multi-disciplinary research project undertaken in collaboration with the Mithaka People in southwest Queensland, Australia, a collection of wooden artefacts came to light. This presentation will focus on two sword-like artefacts that were part of the collection and discusses what they might be and where they may have originated.

Mithaka Country is situated roughly in the centre of the deserts that make up the Channel Country, an extensive endorheic river system formed by the Georgina and Diamantina Rivers, and Cooper and Farrars Creeks, which do not reach the sea but collectively supply most of the water to Kati Thanda-Lake Eyre. This environment is a "boom and bust" ecological system, with the desert experiencing massive semi-annual floods deriving from monsoonal rainfall in the north, which fills thousands of braided channels for which the region is named.

Exchange/trade routes criss-crossed Australia forming a "Chain of Connection" that linked people across thousands of square kilometres. This interconnected network incorporated the movement of goods/items through reciprocal exchange, short-distance down-the-line barter and long-distance transfer-trade of goods over many hundreds of kilometres, involving large-scale expeditions. Mithaka Country lies near the centre of the extensive Kati Thanda-Lake Eyre Basin trade network.

In this presentation, it will be suggested that the sword-like artefacts may have moved across extensive distances, following the Kati Thanda-Lake Eyre basin trade network and other trade routes, and along the "Dreaming tracks" with which the trade routes are frequently associated.

The research on which this presentation is based was undertaken in collaboration with the Mithaka Aboriginal Corporation.

Water sources in the desert: Preliminary results from an important aridzone water source, Goodingu, on Thalanyji Country in northwestern Australia

<u>Wendy Reynen¹</u>, Kane Ditchfield¹, Chae Byrne¹, Fiona Hook^{1,2}, Natasha Moore², Peter Veth^{1,3} and Buurabalayji Thalanyji Aboriginal Corporation⁴

¹Department of Archaeology, Forensics, Geography and Anthropology, UWA; <u>wendy.reynen@uwa.edu.au</u>

²Archae-aus Cultural Heritage Management Pty Ltd

³ARC Centre of Excellence for Indigenous and Environmental Histories and Futures ⁴Buurabalayji Thalanyji Aboriginal Corporation Registered Native Title Body Corporate

Goodingu: An important early nexus of Australian desert occupation between the coast and the arid inland in Thalanyji Country, northwestern Australia.

Water sources are critical to facilitating the settlement and evolution of human desert settlement. Between the coastal strip and arid inland uplands in Thalanyji Country lies an intermediate zone of dunes and sand plains which is devoid of potable water except for a series of large rock holes set within granite domes. These form a strategic chain of water sources across an arid plain, linking riverine corridors from the coast to the interior. Archaeological records at these granite domes hold potential to address questions around early desert settlement and the continued persistence of desert groups through major changes in climate. Goodingu, a culturally important place for Thalanyji People, is a granite dome with substantial permanent water source. The surface archaeological assemblage includes a diverse stone artefact assemblage, inscribed rock art and grinding patches. Excavations have revealed economic fauna, grindstones, and dense stone artefact assemblages. Goodingu likely functioned as an important early nexus of occupation on Thalanyji Country, facilitating settlement as early as 50,000 years ago. Ranger training, Traditional Owner training and "two-way learning" between the community and researchers underpins the work at Goodingu. A central objective of the project is to support Thalanyji Rangers to document and protect their cultural heritage for future generations.

Drylands: Studying the transhumant, ephemeral past in the Northern Cape, South Africa and Namibia combining remote sensing and oral histories

Kiah Johnson

PhD Candidate, University of Cambridge, Supervisor: Professor Paul Lane; <u>kj378@cam.ac.uk</u>

The Orange River as a colonial frontier and, later, as a national border, is one of the challenges specific to archaeological research between South Africa and Namibia. Climate, logistics, as well as lack of infrastructure and mapping, are regional challenges common to arid environments, but this in addition to the primarily transhumant practices of regional inhabitants into the recent past has made archaeological study challenging south of the Orange River. Particularly, transhumant pastoralists and foragers living in open-air mobile camps have seen proportionally little study due to disturbance and low visibility making them hard to identify, and with little to no stratigraphic preservation, they remain difficult to analyse chronologically.

This talk explores the unique opportunities offered by arid, low-vegetation environments with low population density. I will discuss preliminary results of remote sensing and aerial mapping from my PhD project, test pit results from identified historical contexts, as well as the value of interdisciplinary method (particularly ethnography and oral history) in finding sites and better interpreting what remains. I will compare scholarship and approaches between Namibia and South Africa and the resulting body of material available. The national border is a new one, and movement across it is a well-known occurrence in the documented past as well as in contemporary communities. I highlight the potential of larger-scale landscape analysis to predict sites and interpret seasonal land use practices, as well as continuity and change between the two present-day countries of South Africa and Namibia.

A case for springbok funnel-hunting with the Keimoes desert-kite structures, South Africa

Marlize Lombard

Palaeo-Research Institute, University of Johannesburg, South Africa; mlombard@uj.ac.za

In the Levant and some arid zones of Central Asia, desert kites are wellknown hunting structures, often thought to have been used for the large-scale harvesting of gazelles during the Holocene. Until recently, such structures were unknown from the southern hemisphere. However, several kite sites have now been identified around Keimoes in the arid hinterland north of the Gariep on the Bushmanland-Kalahari Duneveld ecotone. In this contribution I use aspects of gazelle behaviour, and local ethno-historical records, to explore the possibility that the stone-built kites or funnel chains of South Africa may have been used to hunt springbok (*Antidorcas marsupialis*), southern Africa's only gazelle. I argue that seasonal herds of gazelles, colloquially known as *trekbokken* (large springbok herds on the march), were a possible target of precolonial hunters who used their intimate understanding of the animals and their landscape to design the kites.

Looking for stonewalled desert kites in the Nama Karoo Biome of South Africa: aerial desktop survey and exploration of landscape movements through predictive modelling and GIS

<u>Matt G. Lotter</u>¹, Matthew V. Caruana², Tim Forssman^{1,2,3}, Sebastian Bielderman⁴ & Marlize Lombard¹

¹Palaeo-Research Institute, University of Johannesburg, South Africa; <u>mmatt@uj.ac.za</u>

²Cultural and Heritage Studies, School of Social Sciences, University of Mpumalanga, South Africa

³Department of Anthropology and Archaeology, University of Pretoria, South Africa ⁴School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, South Africa

The recent identification of kite sites on the arid Keimoes landscape, in the Northern Cape Province of South Africa north of the Gariep River, has shed light on how past populations built and utilised low stone structures to funnel and capture game. With this contribution, we revisit the Keimoes landscape to continue our search for more funnel sites using an aerial desktop survey strategy. We also investigate the placement of the kites relative to key landscape features and employ Geographic Information System (GIS) software to perform least-cost path analyses to explore human-animal movements. We introduce all known kite sites across the Keimoes landscape while highlighting three newly recorded kite locations. Our pathway results confirm that the Keimoes landscape was probably one of complex interconnectedness, with dynamic human land-use patterns that incorporated the strategic use of local landscape features that would have facilitated kite construction and potentially maximised hunting proficiency.

Imagining a 'pleasant place': A rock engraving site in the Trans-Gariep Nama Karoo, South Africa

Jeremy Hollmann

Rock Art Research Institute, School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, Private Bag 3, Wits, 2050, South Africa; jeremy.hollmann@gmail.com

The Keimoes Engraving Site 01 (KES 01) north of Keimoes, Northern Cape Province, is a recently documented site with just over 50 recorded instances of rock markings. These comprise engravings of human footprints, animal motifs and smoothed and pecked areas on an outcrop. The KES 01 engravings provide an opportunity to investigate the 'problem of the animals', i.e. the predominance of animal images and their frequent presentation as solitary figures portrayed in a standing posture. This phenomenon has been noted previously but not investigated. Here the concept of 'wind', a prominent theme in 19th-century |xam ethnography and 21st and 20th century anthropological and ethnographic studies, is the basis for imagining what the engraved images 'do'. It is argued that the engravings themselves have a 'wind' that is specific to the potency of the animal depicted. Their presence on an outcrop in the vicinity of a pan, a prominent steep-sided koppie (butte) and several funnellike structures (kites) is seen as part of an invisible network of interacting winds that contribute to what one of the 19th-century |xam described as a 'pleasant place'.

I believe global indigenous and displaced peoples' dialogue needs to join up as a collective impact and accountability framework to the [mining] sector and beyond; the power is in our shared purpose. - Vanessa Elliott

Session 4 MINING THE DESERT



The paradox of uranium exploration drilling in a national park.

Mineral resource sector sustainable development in the energy transition

Karin Olson Hoal

Wold Family Professor in Environmental Balance for Human Sustainability, Cornell University, Ithaca, New York, USA; <u>keo52@cornell.edu</u>

The green renewable energy transition will require a rapid increase of production of not-so-green metals and minerals. These materials are generally expected to come from an expansion of mining as has been done historically. That does not need to be case. The mineral resources sector is undergoing a rather remarkable transformation in new approaches, technologies, and sensitivities. Much of that effort revolves around mitigating impacts of extraction on original people, communities and delicate environments largely in the global south which host desirable resources. Early characterization of the subsurface coupled with adaptive processing and data-fueled projections of future impacts is changing mining. Revalorization of byproduct materials as feed for other value chains is changing the post-extraction scenario. Examples from Chile, Australia and Namibia show how impacts can be minimized with a shift in methods. The ICMM, DPI, GCICR, RESOLVE and other industry efforts place Indigenous people, communities and delicate landscapes at the forefront of decision making through ESG and sustainable development. The future looks promising, with Australia and Canada leading in this space. Past damage regarding archaeological sites, ancient people, and degradation of landscapes, however, now require knowledge share and conversations with communities as well as dedicated investment. Quite simply, a lot of primary materials will be needed to lift billions of people out of poverty worldwide. The mineral resource sector can be a positive force for the sustainable development of humanity globally, and not only for the renewable energy transition, with this adoption of new priorities.

Share Bene its and Inclusion Capital: Are we there yet? The resources sector journey to First Nations in Australia

Vanessa Elliot

Intercultural planner and capacity builder from Northern Australia. Perth, Western Australia; <u>vanessamarieelliott@gmail.com</u>

Enduring Value is a concept that needs a shared working definition. Net zero is a land hungry proposition that has created a whirlpool of renewable and critical mineral development opportunities in Australia and beyond. The ore bodies and zones that are sought lie in lands sacred to First Nations and in many instances in areas of previous mining activity. Mining in Australia created an economic divide: how do we move to inclusive capital? The economic value of mining has more often than not created complexities and ecological trauma not yet fully defined by First Nations. So how do we increase the voice and influence of First Nations from within the sector? How do we grasp concepts of share benefit and inclusive capital when history has for the most part excluded shared equity in development? What should the regulator do to support people on traditional lands to grasp and manage mining impacts? The power of change management lies in our history and our stories. The purpose of traceable productivity and performance must increase our shared value. This presentation will provide insights of this journey and a perspective on the following critical questions: How can First Nations best contribute to the sector without eroding their own cultural values? What does Nature-positive mean for us now? What is our greatest asset and contribution to the mining and energy economy?

Vanessa Elliott is a Jaru First Nations woman from the Kimberley region of Western Australia. She will share snapshots of thirty years cross sectoral experience in Mega Project planning and impact management. Her story and insights are about collective impact and the connection needed to bring alignment, hope, honour, healing, and agency to those trapped in a development conundrum where poverty prevails and neighbours industrialized progress.

Engaging ‡Aonin heritage politics and practices in reckoning with historical and present injustices along the central Namibian coast

Elsemi Olwage

Independent Researcher, Windhoek, Namibia, formerly One Ocean Hub project; email elsemi.olwage@gmail.com

Global movements and changing political currents at the national level have led to increased discussion on the rights of marginalised and indigenous communities within marine and coastal governance. In the Namibian context, this is contributing to a growing visibility for the ‡Aonin (Topnaar) community's silenced maritime and coastal heritage, belonging and indigeneity within this public-political sphere. Against this background and based on initial socio-historical and ethnographic research, this paper engages with indigenous and creole heritage practices on Namibia's arid coast, expressly by members of the ‡Aonin community. It traces some of the current practices of surfacing and contesting these pasts to attend to two key problematics: land and spatial justice, and the question of benefit-sharing in an institutional context that is deeply fragmented and privatised. In doing so, I focus on how these practices are trying to reckon with a landscape shaped by powerful extraction and conservation regimes, an insular marine space, and historical injustices.

Geotechnical challenges for landfill planning in arid semi-desert and desert regions

<u>Juris Burlakovs</u>^{2,3}, Zane Vincevica-Gaile¹, Maris Krievans^{1,2}, Mikelis Cerpins¹, Vita Rudovica¹

¹University of Latvia, Latvia ²Riga Technical University, Latvia; <u>juris@geo-it.lv</u> ³Estonian University of Life Sciences, Estonia

The evolution of waste management in desert regions, driven by population growth and urbanization, should reflect the global shift toward sustainability in waste management, e.g. water resources should be protected, the desertification process should be limited, and recycled materials should be used for construction. Waste management approaches differ due to the slow natural decomposition process, limited vegetation as stabilizing cover, water scarcity, and lack of suitable land, because arid regions are often protected territories due to sensitive environments and endemic biodiversity.

Planning a landfill in a desert or semi-desert region requires consideration of the unique environmental conditions and challenges: 1) appropriate locations away from environmentally sensitive areas, residential zones, and water bodies, with consideration of the terrain, hydrology, proximity to logistics infrastructure and geological factors; 2) comprehensive environmental impact assessment; 3) evaluation of liners and leachate collection systems to avoid uncontrolled discharge of potential contaminants by rare but aggressive storm water flooding. Specific amendments and technologies must be applied to the geotechnical construction of waste management facilities to take into account the high filtration rates of aeolian sand, the harsh environmental conditions, soil stabilization and extreme temperatures to strengthen geotechnical properties (bearing capacity, density) and ensure stability over time.

Collaboration among geotechnical engineers, environmental scientists, and local authorities is essential for implementing these solutions in challenging desert and semi-desert environments.

Redeeming Nature: Desert extraction and the Protestant ethic in Namibia

Christopher R. Hill

Associate Professor of History, University of South Wales, UK; christopher.hill@southwales.ac.uk

As European missionaries began to settle in southwestern Africa from the early nineteenth century, it was not only souls that they sought to redeem from original sin: it was the land and earth itself. Christian redemption provided a powerful philosophy through which missionaries sought to save not only the 'children of the desert', to quote the Congregationalist missionary, Robert Moffat, but also the 'barren' and 'degraded' environment. In this paper, I develop the argument that Christian redemption was a significant component of the European struggle to bring southwestern Africa into the orbit of European capitalism. Drawing on Max Weber's *The Protestant Ethic and the Spirit of Capitalism*, I suggest that Protestant values laid the ideological foundations of extractive capitalism under British and German imperialism.

Ethical mining: A conceptual overview

<u>Mike Hannis</u>

Senior Lecturer in Ethics, Politics and Environment, Bath Spa University, UK; <u>m.hannis@bathspa.ac.uk</u>

As is routinely noted, it is hard to overstate the centrality of mineral extraction to human civilisations throughout recorded history. This has not always involved ethical reflection, but there has been significant activity in the decade since a landmark paper lamented 'the missing ethics of mining'. Industry actors, professional bodies, investors, governments, international agencies and academics have all contributed to the rapid proliferation of standards and schemes aiming to define, promote and incentivise ethical mining across a wide range of contexts. The scale and ubiquity of the sector makes this a daunting and multifaceted exercise, as vividly illustrated by the UNDP's (2016) mapping of numerous major responsibilities and challenges for the sector onto each of the 17 Sustainable Development Goals.

Concise overarching ethical principles are key to ensuring that strategies to address this emerging complex mesh of (often incommensurable) social and environmental challenges are coherent and avoid collapsing into everlengthening checklists of aspirations, indicators and objectives. Yet these higher-level principles must be sufficiently open-ended to respond to developments and contexts which raise additional ethical dimensions, such as the ongoing and proposed expansion of extractive subsectors implicated in urgent technological transitions away from fossil fuels. Ethical theory may be of some assistance here in conceptualising the required relationship between micro objectives and macro principles: utilitarian, Kantian and Aristotelian traditions suggest different approaches, all of which have both merits and disadvantages.

This presentation aims to inform and contribute to the proposed discussion at SD6 of specific ethical guidelines for mining in desert and dryland areas.

Preserving Namibia's heritage: Challenges and opportunities for the National Heritage Council

Agnes Shiningayamwe and Lenishwa Engelbrecht

National Heritage Council, Windhoek, Namibia; shiningayamweagnes@gmail.com

The National Heritage Council of Namibia (NHC), a governmental body tasked with conserving and preserving Namibia's rich cultural and natural heritage, plays a vital role in safeguarding the country's invaluable resources. Numerous challenges impede its efforts, such as the encroachment of both legal and illegal mining activities near heritage sites, which pose a significant threat to their integrity and sustainability, and widespread non-compliance with heritage research permits/consents which undermines the Council's regulatory framework and conservation objectives.

Effectively communicating the importance of heritage conservation to the public and stakeholders remains a persistent challenge, as does addressing contested ownership of heritage resources, the looting of heritage sites, vandalism and ongoing tension between development and conservation. These challenges highlight the need for a balanced approach that accommodates both economic growth and heritage preservation.

The complexities of adhering to conflicting laws from different ministries can create legal and administrative hurdles. The protracted nomination process for declaring national heritage sites is another significant obstacle, often resulting in delays and administrative inefficiencies. Additionally, a lack of support from key stakeholders hinders the Council's ability to implement effective heritage protection measures.

Despite these obstacles, there are potential opportunities and strategies to enhance heritage protection measures. Emphasis will be placed on fostering collaboration with stakeholders, building a more robust support network for heritage conservation, creating public awareness programmes, and developing innovative approaches. By addressing these challenges and capitalizing on available opportunities, the NHC can ensure the sustainable preservation of Namibia's diverse heritage for future generations.

A suggested protocol for mining and heritage protection in the Namib Desert

John Kinahan

Namib Desert Archaeological Survey, Windhoek, Namibia; jkinahan@iafrica.com.na

The Namib Desert contains a globally important one-million-year record of human history which is threatened by intensive mineral exploration and mining activity spurred on by the demands for new energy technologies. Alienation of traditional ownership and access, destruction of cultural heritage resources and the disruption of landscape integrity are among the much-overlooked costs of this short-lived and narrowly focused economic activity.

A large proportion of mining-related activity is concentrated within the boundaries of the Namib Naukluft National Park which contains thousands of well-preserved archaeological sites. Access to this area by traditional communities has been strictly limited since its proclamation as a game reserve in 1908. The material remains of even quite recent settlement are protected by law and now resort under the ownership of the State.

Developer compliance with the National Heritage Act is nominal and perfunctory. No mining project has been refused permission to proceed on grounds of its likely impact on archaeological or heritage resources. Community consultation is extremely rare. There is room for improvement in the relations between mining projects, the environmental sector, heritage regulatory authorities, traditional communities and the archaeologists who carry out field assessments.

I propose that the field of archaeological or heritage assessment should be separated from environmental assessment, that more rigorous standards should be adopted by the heritage authorities, including independent peerreview of large-scale project reports. I propose that the area of responsibility for developers should be widened to include post-fieldwork analysis costs, training and publication of results. I propose that traditional communities should be integrated at every level from the company board to field trainee.

Stories were told of [the Desert Fathers] hidden deep within the darkness of their desert cells: it was said that they engaged with demons; that they fell, during their life of seclusion, into both despair and ecstasy; and that, partly because of their struggles, they were given abilities to heal. Their desert homes were said to be centers of spiritual power.

Robert L. Harris (2023) *Returning Light: Thirty years on the island of Skellig Michael*, page 119

Session 5 LIVING IN THE DESERT



Migratory oryx antelope in the southern Namib desert landscape were subject to organised communal hunts.

50,000 years of resilience in the Australian deserts: The Desert People Project

<u>Peter Veth</u>^{1,2}, Wendy Reynen¹, Kane Ditchfield¹, Chae Byrne¹, Fiona Hook^{1,3}, Matthias Leopold⁴, Timothy Cohen^{5,6} and Nathan Jankowski^{5,6}

¹Department of Archaeology, Forensics, Geography and Anthropology, UWA; <u>peter.veth59@gmail.com</u>

²ARC Centre of Excellence for Indigenous and Environmental Histories and Futures; ³Archae-aus Cultural Heritage Management Pty Ltd

⁴School of Agriculture and Environment, UWA

⁵School of Earth, Atmospheric and Life Sciences, University of Wollongong

⁶ARC Centre for Excellence in Australian Biodiversity and Heritage

Over the last decade our understandings about the timing and nature of Australian desert settlement, social complexity and technological flexibility have been significantly progressed through improved representation of bioregions, increased sampling, advances in chrono-stratigraphy, multi-scalar approaches and the rise of Indigenous-led research programs. As near-50 ka occupation records are returned from a range of sites from the northwest and southeast of the continent, many previous gaps in occupation are being filled. This is especially true for rock shelter sites in the northwest where multiple phases of occupation have now become available from the Last Glacial Maximum (c. 24 – 18 ka). Indeed, recent excavations from several sites in the Pilbara uplands (e.g. Yirra and Bangkangarra 2) suggest that the greatest level of occupation occurred during this climatic phase. There are also an increasing number of sites dating back to 50 - 45 ka from the wider northwest with indications from some that onset of first occupation may have occurred earlier; a proposition which will be examined over the next five years. These and allied issues relating to resilience and sustainability in the Australian arid zone are being investigated in a multi-disciplinary ARC research project Desert People: Australian Perspectives. The project, its key questions and the research team will be outlined in the talk.

50,000 years of semi-arid zone maritimity, Boodie Cave, Barrow Island, NW Australia

Fiona Hook, University of Western Australia

fiona.hook@uwa.edu.au

In this presentation I investigate archaeological evidence for the early production of Melo (or commonly named 'baler') shell knives recovered from Late Pleistocene and Early Holocene deposits in Boodie Cave, Barrow Island. The site is in the Country of Thalanyji people in northwestern Western Australia. The oldest shell knife fragments were recovered from units dated to 46.2-42.6 ka, making this one of the oldest Homo sapiens sapiens shell tool technologies currently described. I situate this early and ongoing tradition of shell tool manufacture within recent discussions of the early development of shell industries from both Island Southeast Asia and globally. Although shell knives have been previously reported from Pilbara and Gulf of Carpentaria surface middens in northern Australia, systematic analysis of the manufacturing process and associated debris, and especially from pre-Holocene contexts, has not been previously conducted. This research explores the shell knife chaîne operatoire through the integration of three data sets derived from archaeology, ethnography, and experimental archaeology. This study highlights the significance of shell tool industries in the northwest of Australia, and globally, from the Pleistocene and into the Late Holocene in areas with limited access to hard rock geology where shell reduction represents a unique technological strategy.

The PaleoLeba Project: Investigating Stone Age culture and landscape change in the Angolan Namib Desert

Daniela de Matos^{1,2,3}, David Nora⁴, Elena Robakiewicz³, José Fernandes⁵, Evandra da Mata⁶, Manuel Neto⁵

¹Centro de Arqueologia (Uniarq), Universidade de Lisboa, Portugal; <u>daniela.de-matos@uni-tuebingen.de</u> ²Centro de Geociências, Instituto Terra e Memória, Universidade de Coimbra, Portugal ³Dept. Geosciences, University of Tübingen, Germany ⁴University of Jerusalem, Israel ⁵Instituto Politécnico da Huíla, Universidade Mandume Ya Ndemufayo, Angola ⁶Universidade do Namibe, Angola

Reconstructing human adaptation and environment dynamics in the Stone Age of south-west Angola is the key goal of the PaleoLeba Project. The project integrates national and international peers, museums, universities, and local communities dedicated to science and conservation of the fragile populations and ecosystems in the Angolan Namib Desert. The team applies a multidisciplinary approach combining archaeology, geosciences, and heritage conservation to understand the formation of archaeological sites and track the evolution of human culture since the Pleistocene. Here we present the results of ongoing research about the Stone Age of the Angolan Desert based on recent fieldwork and research with museum collections.

The timing of megafaunal extinction in Australia and human interactions

<u>Patrick De Deckker</u>¹, Sander van der Kaars², Matthew Adeleye³, Simon Haberle⁴, Quan Hua⁵

¹Research School of Earth Sciences, The Australian National University, Canberra ACT 2600, Australia; <u>Patrick.DeDeckker@anu.edu.au</u>

²School of Earth, Atmosphere and Environment, Monash University, Monash University, Clayton, VIC, 3800, Australia

³Department of Geography, University of Cambridge, CB2 3EL, Cambridgeshire, UK ⁴School of Culture, History and Language, The Australian National University, Canberra ACT 2600, Australia

⁵Australian Nuclear Science and Technology Organisation, Lucas Heights, NSW 2234, Australia

People inhabited northern Australia as early as 65 ka ago, dispersing across the continent by a few millennia before 45 ka. In Tasmania, there is no evidence of human occupation before 40 ka even if a land bridge across the now shallow Bass Strait would have facilitated the eventual arrival of people there.

With respect to the peopling of the Australian continent characterised by a vast array of climate types, vegetations and food supplies, one major question remains: *What were the consequences of people's arrival on the Australian biota?*

By the time people were well established on this vast continent, a major ecological crisis occurred: viz. the extinction of many of the very large endemic animals, such as marsupials (both herbivores and carnivores), birds and reptiles. The timing of the extinction is now well defined and is placed at \sim 43.3 ka, based on the disappearance of coprophilous fungal spores in a high-resolution deep-sea core taken close to the mouth of the River Murray that drains the entire 1.10⁶ km² Murray-Darling Basin of southeastern Australia.

A second important question relates to causes of these extinctions: Were they caused by human predation, human fire, climatic and vegetation changes?

Dramatic environmental change in Andean/pre-Andean drylands in the Holocene

<u>Paul Hesse</u>¹, Joaquin Spinelli¹, Kira Westaway¹, Maria Isabel Hernandez Llosas², Adriana Mehl³ and Alfonsina Tripaldi⁴

¹School of Natural Sciences, Macquarie University, Sydney, Australia;
<u>paul.hesse@mq.edu.au</u>
²CONICET, Institute of Archaeology, University of Buenos Aires, Argentina
³CONICET, National University of La Pampa, Argentina
⁴CONICET, Institute of Geology, University of Buenos Aires, Argentina

In the 'arid diagonal' of southern South America humans occupied a harsh environment during the Holocene, with agricultural societies extending south in the arid Puna-Altiplano and herding or hunter-gatherer societies occupying the lowland pre-Andean drylands. In three different areas: the arid Puna of northern Argentina, the arid-semi-arid transition of the Atuel-Diamante basin and the semi-arid/sub-humid western Pampas of central western Argentina, indicators of past climate exist in both fluvial and aeolian records.

In the Utracan-Argentino valley of the western Pampas multiple episodes of aeolian activity are inferred from the dune forms in this cropping and grazing landscape. pIR-IRSL dating of dune sands confirms widespread activity (including barchanoid and transverse dune forms) between 5-4 ka and 2-0.8 ka because of regional atmospheric circulation, lower precipitation and reduced vegetation cover.

The mega-fan of the Atuel-Diamante basin preserves multiple palaeochannels abandoned by repeated avulsions. Alluvium was reworked into sand dunes which now cover most of the fan surface. In recent times the entire aeolian and fluvial surface was stabilised by monte vegetation.

In the eastern Puna, deep alluvium records the development of wetlands and pastures critical to livestock grazing and cultivation. Small stabilised climbing sand dunes ('huancar') attest to more arid conditions with lower vegetation cover in the Holocene.

These data contribute to a picture of high sensitivity of the arid zone to Holocene climate change with large implications for past and present societies.

Evaluating the possible reasons for chronological hiatuses and technological changes in Central-South Patagonia: The case of the Pleistocene-Holocene transition and the early Holocene

Nora V. Franco¹, Ted Goebel², Kelly Graf³ and George Brook⁴

¹IMHICIHU-CONICET & Universidad de Buenos Aires, FFyL, Depto. Ciencias Antropológicas; <u>nvfranco2008@gmail.com</u>

²The University of Kansas

³ The University of Kansas

⁴ The University of Georgia

Chronological hiatuses and technological changes have been recorded in different spaces in Central and South Patagonia from the Pleistocene– Holocene transition to the Late Holocene. Central and South Patagonia is a vast space which was one of the last humans reached. The hiatuses and changes have been related to different causes, such as environmental ones, extinction of megafauna, reorganization of technology and entrance of new people. We will discuss here the case of the Pleistocene-Holocene transition and the early Holocene. By this time, a technological change has been identified at a multi-regional scale. In the case of central-south Patagonia, it is accompanied by a chronological hiatus. Reasons are explored and the possibility of entrance of new populations is discussed.

It's a long shot: The 'impact' of arid climates on the use and transmission of the sling and the bow in South America

Erik J. Marsh

Adjunct Researcher and Professor, Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Laboratorio de Paleoecología Humana, Universidad Nacional de Cuyo, Mendoza, Argentina; <u>erik.marsh@gmail.com</u>

Projectile weapons are one of Homo sapiens' most effective means of adapting to climates around the world, including the arid ecoregions of South America: the Pacific coast, the dry Andes, and Patagonia. In these areas, environments provide abundant resources for slings: stones, fibre, and wool. For this reason, the Andean sling tradition is one of the world's oldest, dating back to at least the middle Holocene, and contrasts with the lack of abundant stone and slings in the Amazon basin. In contrast, the bow is relatively recent, only appearing two thousand years ago, though some authors suggest an earlier date. Based on recent metric studies, dart points can be smaller than once thought and arrow points should be narrower than 14 mm. This late appearance is due to 1) the lack of necessity, since both spear throwers and slings served a similar function and 2) in dry regions, there are few woody plants suitable for making bows and shafts. Bows appear as Andean population increases with more active trade caravans and contacts between the Amazon and the Andes. After the bow appears, it spread rapidly, probably because it is generally more effective and versatile. It was used for both hunting and interpersonal conflict and was especially prominent during Inca and Spanish conquests. Bows appear frequently as grave goods, perhaps because they were also prestige items tied to masculine identity, as suggested by ethnographic cases. I propose that the continent's especially Arid Diagonal, a large swath with sparse social networks and a lack of woody plants, slowed the bow's cultural transmission. Later, when this technology reached Patagonia, the bow was used alongside multiple other projectile weapons, including spear throwers and bolas. At Spanish contact, the bow was present throughout the continent, in all ecosystems, while the sling remained mostly limited to arid zones.

Arid environments and Modern humans' Adaptation Strategies – introducing the ARIMAS project

Matthias Blessing^{1,2} and Aurore Val^{3,4,5}

¹University of Connecticut, Anthropology Department, Deep History Lab, USA; <u>matthias.blessing@uni-tuebingen.de</u> ²University of Tübingen, Department of Geosciences, Working Group Older Prehistory and Quaternary Ecology, Germany ³Laboratoire Méditerranéen de Préhistoire Europe Afrique, UMR 7269 CNRS, France ⁴School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, Johannesburg, South Africa

⁵ICArEHB - Interdisciplinary Center for Archaeology and the Evolution of Human Behaviour, Universidade do Algarve, Portugal

The ARIMAS project borrows its name from Arimas Farm in the Karas Region in southern Namibia, where it is situated in the Huns Mountains. The project is an archaeological survey and excavation project that aims to understand the interaction between human societies and arid environments in the deep past on a landscape scale. The interpretation of the archaeological record in southern Africa still relies heavily on coastal cave sites in South Africa, but several research efforts have shown the potential of archaeological research in the arid environments of the region's dry interior. Our first survey and test excavation on Arimas Farm revealed a high potential of archaeological research related to questions around the dynamics of human movement across and interaction with arid environments. The ARIMAS project aims to complete an archaeological survey of all 250 km² of Arimas Farm, which will form the basis for further studies on human-environments interactions represented there through time. In parallel to the survey, test excavations are being conducted that will allow us to establish spatial and chronological relationships between the open-air lithic scatters and cave or rock shelter site on Arimas Farm.

A Late Pleistocene palaeoenvironmental record for northern Namaqualand, South Africa: Geoarchaeology, geochronology, and stable isotopes from Spitzkloof A Rockshelter

<u>Genevieve Dewar</u>,¹ Mingzhe Damon Dai,² Sarah Kivisto,¹ Olivia Kracht,² Mike Morley,³ Elizabeth Niespolo,² Judith Sealy,⁴ Daniel Sigman,² Brian Stewart⁵

¹Department of Anthropology, University of Toronto; <u>genevieve.dewar@utoronto.ca</u> ²Department of Geosciences, Princeton University

³Department of Archaeology, Flinders University

⁴Department of Archaeology, University of Cape Town

⁵Department of Anthropology and Museum of Anthropological Archaeology, U. Michigan

Excavations at Spitzkloof A Rockshelter, northern Namaqualand, South Africa, identified a deep stratified sequence with pulsed occupation dating to the Last Glacial Maximum (23-17 kcal. BP) and Marine Isotope Stage 3 (>51 ka BP), while the lowest layers are candidates for U-series dating. Importantly, this period encompasses a time of marked climate change, with fluctuating environmental responses within Africa likely requiring human innovations and adaptive plasticity. Abundant ostrich eggshell throughout the deposit (including the undated layers) includes beads and flasks, presumably reflecting social and technological innovations allowing people to forage in the southern margins of the Namib Desert. High-resolution records of climate change in Namaqualand are sparse, yet reconstructing palaeoenvironments is fundamental to understanding how people engaged with the landscape. Large grazers in the LGM deposits suggest wetter environments, while arid-adapted specialists imply drier landscapes in MIS 3. To test these interpretations, we present new geoarchaeological, geochronological, and stable isotope results on ostrich eggshell (C, O, and N) to assess the palaeoenvironmental context and confirm that the LGM deposits reflect wetter environments than exist today. Ongoing analysis will extend to material from the MIS 3 and older deposits to verify the arid signal.

Trade, diversification, and thriving in a desert: The view from Spitzkloof D Rockshelter in northern Namaqualand, South Africa

<u>Courtneay Hopper</u>^{1,2}, Doris Fogarty¹, Camilla Speller¹, Genevieve Dewar^{3,4}

¹Department of Anthropology, University of British Columbia, Canada; <u>courtneay.hopper@ubc.ca</u>

² The Archaeology Center, University of Toronto, Canada

³ Department of Anthropology, University of Toronto, Canada

⁴ Rock Art Research Institute, University of the Witwatersrand, South Africa

This paper presents results from recent excavations at Spitzkloof D rockshelter located in Namagualand, South Africa and situates it within the broader archaeological context of the region. Faunal analysis reveals that the people occupying the site had a broad, highly diverse subsistence strategy consisting of low intensity herding with the consumption of wild species during the Little Ice Age. Using both traditional as well as minimally destructive zooarchaeology by mass spectrometry (ZooMS) analyses on a sub-sample of the faunal material confirms a broad subsistence strategy while adding taxonomic specificity to morphologically unidentifiable bones. Our ZooMS results are also consistent with the presence of sheep and goat at the site. Glass trade beads, iron implements, and limpet shells hint that the people occupying Spitzkloof D were also part of an extensive trade/interaction network both within Namaqualand as well as further north and west. Overall, the people occupying (and reoccupying) the site were taking advantage of the wild species in the immediate area but were also part of a wide-reaching trade network. These results paint a picture of a highly interconnected people, provide valuable evidence for herding in a region with large temporal and geographical gaps, as well as challenge traditional narratives about cultural contact and the assumptions that foragers could not incorporate herding into their lifeways.
Human/camelid encounters: The changing role played by camelids in the economy of fisher-hunter-gatherers on the coast of the Atacama Desert (ca. 4000–500 BP)

Daniela Valenzuela¹, Calogero M. Santoro², Bárbara Cases³, José M. Capriles⁴, Paul Szpak⁵, Verónica Alcalde¹, Andrés Romano⁶, Indira Montt², Adrián Oyaneder⁷, Tessa Grogan⁵, Michelle Salgado³, Eugenia M. Gayó⁸

¹Departamento de Antropología, Universidad de Tarapacá, Arica, Chile; <u>dani.valenzu@gmail.com</u>
²Instituto de Alta Investigación, Universidad de Tarapacá, Arica, Chile
³Independent researcher, Arica, Chile
⁴Department of Anthropology, Penn State University, USA
⁵Department of Anthropology, Trent University, Canada
⁶Universidad Nacional de Tucumán, Tucumán, Argentina
⁷University of Exeter, United Kingdom
⁸Departamento de Geografía, Universidad de Chile, Santiago, Chile

We address the economy (production, distribution, and consumption) of camelids by fisher-hunter-gatherers and horticulturalists of the coastal Atacama Desert, and its transformations during the last 4,000 years.

Camelids were marginal in the human diet, however, the economy integrated other processes involving production, circulation, and use/consumption of camelids. Camelids were increasingly used over time, including offerings and guano as fertilizer; visual depictions in portable (basketry, gourds and textiles) and immovable (rock art and geoglyphs) media, as well as the productive use of fibre in textiles.

We suggest that the traditional archaeological highland/lowland distinction, understood as natural units, ecologically and socio-culturally discrete, should be challenged for further insights into distinctive human/ non-human dynamics in the hyper-arid Atacama Desert.

Unlocking archaeology's potential: Building bridges across disciplines for sustainable development (1/2)

Carla Lancelotti^{1,2}

¹CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra, Barcelona, Spain; ²ICREA, Barcelona, Spain; <u>carla.lancelotti@upf.edu</u>

In this presentation I will build on the results of the project "Resilience and Adaptation to Drylands: Identifying past water management practices for drought-resistant crops (RAINDROPS)" to showcase how a combination of ethnographic, archaeological and modelling approaches can contribute to our knowledge, and ultimately to the devising of sustainable practices, for agriculture in arid and hyper arid areas. In recent years, the incorporation of time-tested practices, encompassing Traditional Knowledge (TK), Local Knowledge (LK), and Indigenous Knowledge (IK), into the framework of sustainable agrifood system development has gained substantial traction. These practices are designed to address challenges such as food sustainability, food sovereignty, and enhancements to agrosystems. While TK encapsulates millennia of experiential wisdom, the insights derived from Long-Term Knowledge (L-TK) have yet to be fully harnessed. Many ancient systems demonstrated greater longevity than modern infrastructure and were often inherently more sustainable. This perspective posits archaeological data as the most potent proxies for L-TK.

Unlocking archaeology's potential: Building bridges across disciplines for sustainable development 2/2

Stefano Biagetti¹⁻²

¹CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra, Barcelona, Spain; ²School of Geography, Archaeology and Environmental Studies (GAES), University of the Witwatersrand, Johannesburg, South Africa; stefano.biagetti@upf.edu

The Southern Deserts Conference presents an excellent opportunity to showcase the recently started project "(Re)Constructing the Archaeology of Mobile Pastoralism: bringing the site level into long-term pastoral narratives (CAMP)". Focused on exploring how pastoralists developed sustainable and resilient livelihoods in arid regions, CAMP integrates cuttingedge approaches from Ethnoarchaeology, Archaeology. Earth Biochemistry, Geography, and Geostatistics. The project Sciences. employs a two-pronged strategy: ethnoarchaeological investigation of contemporary and abandoned pastoral settlements and the study of archaeological pastoral sites. Through detailed topographic mapping, spatially-driven sediment sampling, and chemical characterization using portable X-Ray Fluorescence, CAMP aims to identify anthropic markers and develop interpretative models. This presentation will offer insights into the methodologies applied, emphasizing the project's potential to enhance our understanding of pastoralism in drylands.

Mid-conference day excursion



The routes used by late precolonial people in the Namib are often marked by burial cairns.



The Central Namib showing the area to be visited during the mid-conference excursion: Walvis Bay to Goanikontes Oasis to Swakopmund return.

The excursion leaves Walvis Bay travelling east on the M36 highway, turning north on the D1984 at the start of the coastal dune-belt extending 35 km northward to the Swakop River. Dune 7 at the southern end of the dune-belt is at approximately 400 m one of the highest dunes in the world. The dune-belt is the result of successive episodes of aeolian accumulation since the late Miocene some 5 Ma ago. The advance of the dune-belt cut off the northern arms of the !Khuiseb River and the lower Tumas River.

Turning sharply to the east on the C28, the excursion route crosses the Late Pliocene plains of the Central Namib. This gravel and calcrete surface has little positive topography and represents a Quaternary bevel immediately predating the rapid canyon-like incision of the lower Swakop River during the last two million years. The gravel surfaces have large well-preserved scatters of Middle Stone Age artefacts of a characteristically yellow cryptocrystalline chert. This raw material seems to be derived from intensive use of a single large outcrop source during the last Interglacial about 120 Ka ago.

The features of the Swakop River incision are best viewed at Goanikontes Oasis, where the excursion stops for lunch. Minor tributary drainage of the Swakop River cutting back into the Pliocene plains has created the dramatic Badlands terrain of the so-called Moon Landscape. Most traces of archaeological and recent historical human occupation are concentrated in the upper reaches of tributary drainage rather than the valleys of major river courses such as the Swakop. The surface of this landscape is a slowly deflating palimpsest of episodic occupation during the last one million years.

The excursion visits three sites on the southern side of the Swakop River which represent examples of occupation related to the use of the desert drainage as routes of movement. These include a late pre-colonial élite grave cairn. Stones were added to these cairns by passing travellers and often grew to impressive size. Another is the camp of the Allied forces used on their advance toward Langer Heinrich in 1915. The camp closely parallels similar-aged evidence of the Arab Revolt campaigns in Jordan. After lunch a brief stop will be made north of the Swakop River at a typical desert camp associated with the mid-Holocene commencement of the current Namib Desert arid phase.



Layout of the Allied camp at Husab



Gen. Louis Botha at breakfast 20th March 1915 before advancing on Riet (Courtesy of National Archives of Namibia)





Bronze cavalry spur from Botha's camp at Husab (Photograph courtesy of Jim Stejskal)



Site of mid-Holocene encampment north of Goanikontes, with dwelling features positioned in relation to "tramline" dyke.



Mid-Holocene encampment north of Goanikontes, showing location of dwelling features.

The 6th international meeting of southern hemisphere desert scientists links current research in the drylands of Australia, southern Africa and South America. Conference presentations review the state of research in the great southern deserts of the world; they address broad thematic questions and include detailed local studies. For the first time, the conference discusses the impact of mineral exploration and mining on the archaeology of the Southern Deserts and the Indigenous communities with historical ties to these landscapes.

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23.9

SOUTHERN DESERTS 6